ARS-3020 Disk Box

User's Manual

Version 1.0

Release: September 2004

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Chapter 1 Introduction

1.1 Overview

ARS-3020 is an external data storage equipment. It provides JBOD solution, and meets the requirement of large data capacity in Digital Video Recording (DVR) / Digital Audio Recording (DAR) / Media Streaming. Its capacity can reach 15TB by installing 250GB * 60 hard drives; that is, 15 sets. It uses ACARD's leading SCSIDE technology, that lets you enjoy the best SCSI performance by using inexpensive IDE hard drives. And it offers 4 swappable trays for convenient replacing of hard drives.

1.2 Features

- Capacity up to 1TB by connecting 250GB * 4 hard drives
- Offers 4 swappable trays for convenient replacing of hard drives
- High scalability up to 15 sets with 40MB/s of data transfer rate; maximum capacity up to 15TB by connecting 250GB * 60 hard drives
- High scalability up to 8 sets with 160MB/s of data transfer rate; maximum capacity up to 8TB by connecting 250GB * 32 hard drives
- Supports 48-bit LBA Big Drive Technology (hard drive over 137GB)
- Built-in ACARD RISC microcontroller core for improving chip performance
- On-board flash ROM for easy firmware update
- Cost-effective and high-perfromance

1.3 Specifications

- 1U rack mount of 44(H) × 483(W) × 400(D) mm
- Host interface
  - Supports Ultra160 LVD SCSI feature with data transfer rate up to 160MB/s
  - Selectable SCSI ID from 0 to 15
- Device interface
  - Supports UDMA mode with data transfer rate up to 133MB/s

- Supports Ultra ATA 133/100/66 HDD
- Two independent channels of IDE bus

- JBOD / Normal mode set by DIP switch
- Safety: FCC, CE
- Temperature
  - Operation: 0°C~50°C (not condensed)
  - Non-operation: –20°C~70°C
- Power

  AC input voltage : 47 ~ 63 Hz

  100 ~ 127V/3A ; 200 ~ 240V/1.5A

  162W

1.4 Hardware Requirement

ARS-3020 needs a host system with SCSI LVD interface of Ultra2 Wide or higher standard. ACARD AEC-67160 or AEC-67162 SCSI adapter is highly compatible with ARS-3020. For the details please contact your distributor.

1.5 HDD Compatibility

ARS-3020 supports DMA 133/100/66 hard drives of the following brands.

MAXTOR	D740X-6L (80G; 40G; 20G) series
	DiamondMax PLUS 8 series
IBM	IC35L180AVV207-1 (185.2GB)
	IC35L120AVV207-1 (123.5GB)
	IC35L060AVVA07-0 (61.4GB)
HITACHI	
Deskstar 7K250 series	HDS722525VLAT80 (250GB)
Deskstar 180GXP series	HDS722520VLAT80 (200GB)
	HDS722516VLAT80 (160GB)
	HDS722516VLAT20 (160GB)
	HDS722512VLAT80 (123.5GB)

	HDS722512VLAT20 (123.5GB)
	HDS722580VLAT20 (80GB)
	HDS722540VLAT20 (40GB)
	IC35L180AVV207 (185.2GB)
	IC35L120AVV207 (123.5GB)
	IC35L120AVVA07 (123.5GB)
	IC35L100AVVA07 (102.93GB)
	IC35L100AVVA07 (102.93GB)
	IC35L080AVVA07 (82.3GB)
	IC35L060AVVA07 (61.49GB)
	IC35L060AVER07 (61.49GB)
	IC35L040AVVA07 (41.17GB)
	IC35L040AVER07 (41.17GB)
	DTLA-307075 (76.86 GB)
	DTLA-307060 (61.49GB)
	DTLA-307045 (46.11GB)
SEAGATE	
Barracuda IV series	Barracuda 7200.7 ST3200822A (200GB)
Barracuda V series	Barracuda 7200.7 ST3200021A (200GB)
Barracuda 7200.7 series	Barracuda 7200.7 ST3160021A (160GB)
	Barracuda 7200.7 ST3160023A (160GB)
	Barracuda 7200.7 ST3120026A (120GB)
	Barracuda 7200.7 ST3120022A (120GB)
	Barracuda 7200.7 ST380011A (80GB)
	Barracuda 7200.7 ST380013A (80GB)
	Barracuda 7200.7 ST340014A (40GB)
	Barracuda 5400.1 ST340015A (40GB)
	Barracuda 5400.1 ST340015ACE (40GB)
	Barracuda V ST3120023A (120GB)
	Barracuda V ST3120024A (120GB)
	Barracuda V ST380023A (80GB)
	Barracuda V ST360015A (60GB)
	Barracuda V ST340017A (40GB)
	Barracuda IV ST380021A (80GB)
	Barracuda IV ST360021A (60GB)
	Barracuda IV ST340016A (40GB)

1.6 Package

After opening the package, check the following items.

- ARS-3020 ×1
- External LVD cable (65cm) ×1
- Terminator ×1
- Power cord ×1
- User's manual ×1
- CD containing Utility for F/W update and Ha! CD Burner ×1
- Pack of screws ×4

1.7 About SCSI

Be aware of the following issues before using SCSI devices.

(1). SCSI ID: Each device attached to the SCSI host adapter must be assigned a unique SCSI ID, which distinctively identifies a SCSI device for its data transfer and processing.

While connecting more than one SCSI devices, each device should have a different ID number.

For Ultra2 Wide SCSI interface, the selectable SCSI ID is from 0 to 15. But 7 is usually reserved for the SCSI adapter.

(2). Terminator: SCSI is featured with high scalability. In order to ensure reliable data transmission on the SCSI bus, a terminator should be installed at the end of the bus.

No matter how many SCSI devices (up to 15) are attached to the bus, a terminator must be added to the last device.

Chapter 2 Installation

This chapter contains 6 parts: The Signal LEDs, Set the SCSI ID, Set the Mode, Install the Hard Drives, Connect the SCSI port, and Replace the Hard Drive.

> **NOTICE** Make sure to power off the system during installation or changing any configuration.

2.1 The Signal LEDs

The signal LEDs of ARS-3020 is as figure 2-2 shows. Besides the power singal LED, there are 8 LEDs on the front panel of ARS-3020. Every 2 LEDs indicate the status of a hard drive.

Figure 2-1

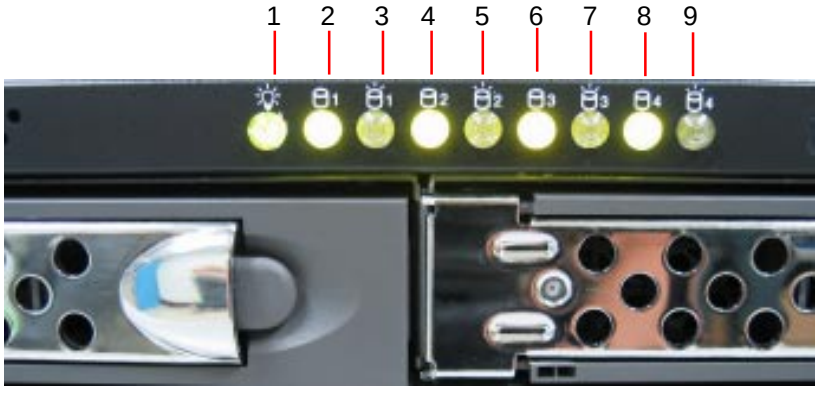


Figure 2-2

No.	The LED	The Display Status
1	Power LED	Green light : Online No light : Offline
2	Primary Master HDD's Power Signal LED	Green light : Online Red light : Offline Blinking red light: Bad sector
3	Primary Master HDD's Access Signal LED	Yellow light : Access No light : No access
4	Primary Slave HDD's Power Signal LED	Green light : Online Red light : Offline Blinking red light: Bad sector
5	Primary Slave HDD's Access Signal LED	Yellow light: Access No light : No access
6	Secondary Master HDD's Power Signal LED	Green light : Online Red light : Offline Blinking red light : Bad sector
7	Secondary Master HDD's Access Signal LED	Yellow light : Access No light : No access
8	Secondary Slave HDD's Power Signal LED	Green light : Online Red light : Offline Blinking red light : Bad sector
9	Secondary Slave HDD's Access Signal LED	Yellow light : Access No light : No access

Table 2-1

2.2 Set the SCSI ID

On the rear panel of ARS-3020 there is a SCSI ID switch as figure 2-3 shows. Set the SCSI ID by adjusting the switch up or down. [Don't set ID 7. It is for SCSI card.]

Setting SCSI ID & configuration mode: Be sure that each device has a unique ID number (see 1.7). No matter how many ARS-3020s (up to 15) are installed and connected, the SCSI ID set on every switch cannot be the same. The selectable number for ARS-3020 is from 0 to 15.

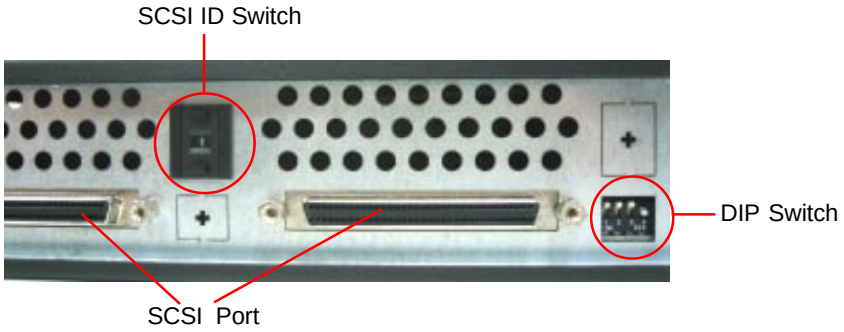
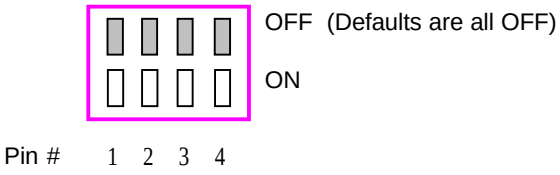


Figure 2-3

2.3 Set the Mode

On the rear panel of ARS-3020 there is a 4-pin DIP switch as figure 2-3 shows. By the switch the configuration of ARS-3020 can be set. Refer to table 2-2 for setting the mode. Defaults of all the 4 pins are OFF.



Mode	Transfer Rate	Pin 1	Pin 2	Pin 3	Pin 4
JBOD	160MB/sec	OFF	OFF	OFF	ON
	80MB/sec	OFF	OFF	OFF	OFF
	40MB/sec	OFF	OFF	ON	OFF
Normal	160MB/sec	OFF	ON	OFF	ON
	80MB/sec	OFF	ON	OFF	OFF
	40MB/sec	OFF	ON	ON	OFF

Table 2-2

(1). Pin 1: Reserved
The default is OFF.

(2). Pin 2: JBOD Mode vs. Normal Mode
The default is JBOD. It combines 2 or more hard drives into a big one. The enlarged capacity is convenient for mass data storage. In Normal mode the SCSI adapter will detect the hard drives you have connected. You need to enable the SCSI adapter's LUN support. Take ACARD AEC-67160 as example. In the SCSI BIOS screen, you need to set "**Support LUN# 0 Upto Max LUN# As....**" as 3 so that the computer can detect all hard drives.

(3). Pin 3: SCSI Host Transfer Rate at 80MB/s vs. 40MB/s
The default is 80MB/s. If the SCSI adapter is not so capable or the signals become unstable after connecting some ARS-3020s, lower the speed to 40MB/s.
However, if you have installed AEC-67160 SCSI adapter, the host PC will automatically detect how many ARS-3020s you have connected, and adjust the transfer rate.

(4). Pin 4: SCSI Host Transfer Rate at 160MB/s
The default is OFF. But if pin 4 is adjusted to ON, the highest transfer rate will reach 160MB/s.

2.4 Install the Hard Drives

Follow the steps below to install hard drives into the trays of ARS-3020.
(1). Open the tray by pressing its handle.

Figure 2-4

(2). Pull the handle to let the tray out.

Figure 2-5

(3). Put a hard drive into the tray.

Figure 2-6

(4). Turn the tray, fasten with 4 screws, and put it back to ARS-3020.

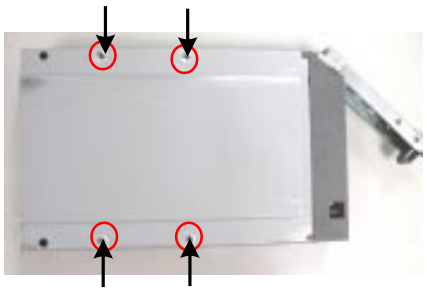


Figure 2-7

(5). Install the other hard drives by repeating step 1 to 4.

Then, set the hard drives as Master or Slave in accordance with figure 2-8.Connect in this way, otherwise the signal LEDs cannot display correctly.

Figure 2-8

2.5 Connect the SCSI Port

Connect one ARS-3020

Connect any one of the SCSI ports on the back of ARS-3020 to the external SCSI port on the host PC with the enclosed SCSI LVD cable. Then, plug a terminator into another SCSI port on the back of ARS-3020. If there is no SCSI port on the host PC, insert a SCSI adapter like ACARD AEC-67160 or AEC-67162.

Daisy chain of ARS-3020s

Use SCSI LVD cables to connect two or more ARS-3020s, and add a terminator to the last ARS-3020. See figure 2-9 and refer to 2.2 for installing more ARS-3020s.

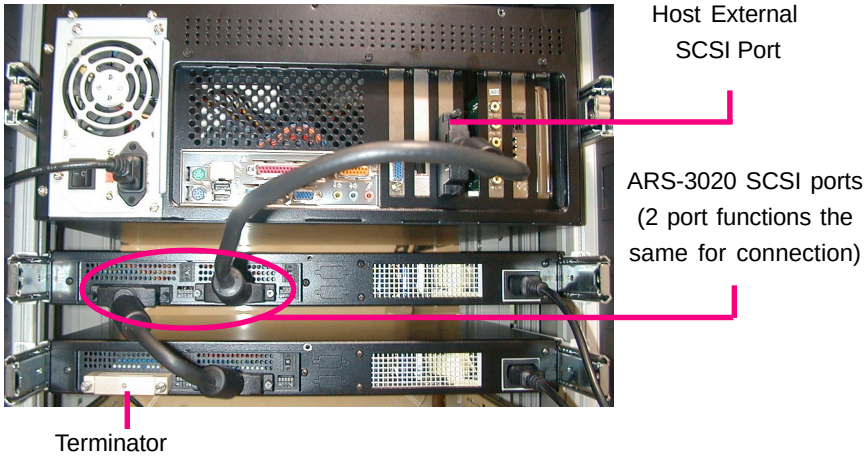


Figure 2-9

NOTICE

1. It is recommended not to attach any single-ended device to the SCSI adapter connecting with ARS-3020. It will drop down the performance of ARS-3020.

2. It is invalid to adjust DIP switch during operation. Before changing the setting, power off the host PC and ARS-3020 first. You had better set JBOD or Normal mode right in the beginning. The later change may damage the stored data.

2.6 Replace the Hard Drive

It is the same as those mentioned in 2.4, but power off the host PC and all operating ARS-3020s first.

Chapter 3 Troubleshooting

If the installed ARS-3020 does not function normally, please check the following items.

(1). LEDs do not display normally after powering on

Examine if DIP switch was set right, and if signal line was connected badly.

(2). Red LED lights after installing a HDD

If you have installed a hard drive, but the red LED lights, please do the following three things.

1. Re-plug the IDE cables and the status signal lines, which are 3-pin color cables connecting to CN6.
2. Replace the hard drive if the red LED still lights.
3. Contact the distributor if the problem still exists.

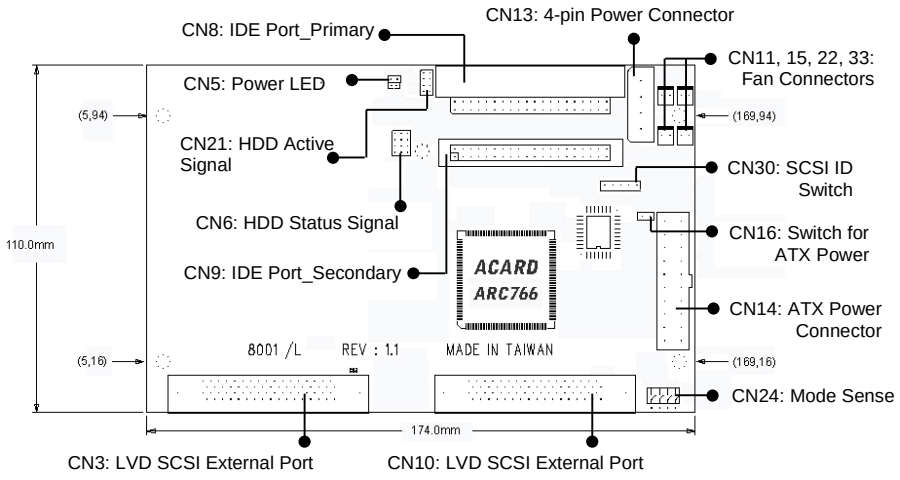


Figure 3-1

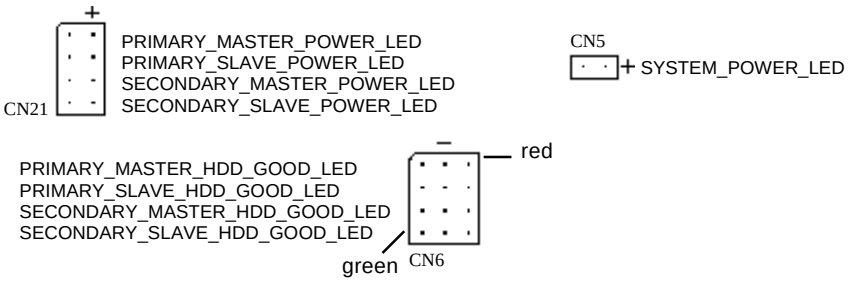


Figure 3-2

(3). The HDD's power LED blinks red for 1 second and green for 9 seconds

The system has detected a bad track. Please get a good hard drive.

(4). The System doesn't show all HDDs in normal mode

Inspect the BIOS screen while booting up the system. See if it displays LUN=3. If not, follow the BIOS setup procedure stated in 2.3.

(5). The HDD's capacity isn't found in the system

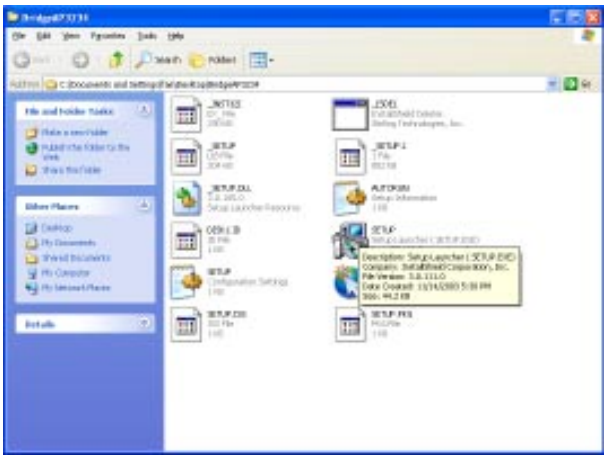
Here let's take Windows XP as an example.

1. Right-click "My Computer" and enter "Manage".
2. Choose "Disk Management" under "Storage", and a given hard drive ID will appear on the right lower corner of the window.
3. If the newly installed hard drive has no ID, "Partition" and then "Format" it.
4. If the newly installed hard drive doesn't appear on the screen, it might be improperly installed or damaged. Try again.

Appendix Update the Firmware

Please follow the steps below to update the firmware of ARS-3020.

1. Put the support CD into CD-ROM, and find the program by the following path: E:\Utility\Bridge_Smart_Uti\Setup.exe.

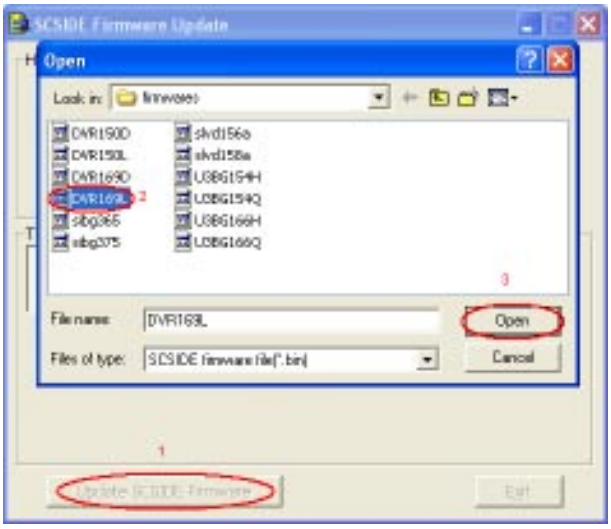


2. Click "Next" to install according to the instructions of wizard.
3. Execute the program from Start\Programs\SCSIDE Firmware Utility.

4. Click the icon of aec67160.

5. Click the icon of Hard Disk. Pay attention to the last 3 numbers and an alphabet of the SCSIDE model like 150L. If the old version's alphabet is L, you should choose a new version with L, too.

6. Click "Update SCSIDE Firmware", choose the new firmware, and click "Open".



7. The system will ask if you want to update. Click "Yes".
8. The successful update is as the following figure shows.

9. Boot again. Repeat step 3, 4, 5 to check if the update is correct.

Technical Support Form

Email: **support@acard.com**
http://www.acard.com

Model: ARS-3020	***F/W Version:**			
System Configuration				
Motherboard *				
BIOS version				
SCSI adapter *				
Chipset				
Memory				
Display card				
Other I/O card *				
OS version *				
Hard Disk				
Brand *				
Model *				
Capacity *				
Problem description * :				

Required columns are marked with asterisks (*) .